REMARKS

Claims 1, 2 and 4-8 are pending in the application.

Claims 1, 2 and 4-8 have been rejected.

Claims 1, 2 and 4-8 remain in the present application.

I.   REJECTION UNDER 35 U.S.C. § 103

Claims 1, 2, and 4-8 were rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,173,009 to Gu (hereinafter "Gu") in view of U.S. Patent No. 4,847,861 to Hamatsu et al. (hereinafter "Hamatsu"). The rejection is respectfully traversed.

In *ex parte* examination of patent applications, the Patent Office bears the burden of establishing a *prima facie* case of obviousness. MPEP § 2142; *In re Fritch*, 972 F.2d 1260, 1262, 23 U.S.P.Q.2d 1780, 1783 (Fed. Cir. 1992). The initial burden of establishing a *prima facie* basis to deny patentability to a claimed invention is always upon the Patent Office. MPEP § 2142; *In re Oetiker*, 977 F.2d 1443, 1445, 24 U.S.P.Q.2d 1443, 1444 (Fed. Cir. 1992); *In re Piasecki*, 745 F.2d 1468, 1472, 223 U.S.P.Q. 785, 788 (Fed. Cir. 1984). Only when a *prima facie* case of obviousness is established does the burden shift to the applicant to produce evidence of nonobviousness. MPEP § 2142; *In re Oetiker*, 977 F.2d 1443, 1445, 24 U.S.P.Q.2d 1443, 1444 (Fed. Cir. 1992); *In re Rijckaert*, 9 F.3d 1531, 1532, 28 U.S.P.Q.2d 1955, 1956 (Fed. Cir. 1993). If the Patent Office does not produce a *prima facie* case of unpatentability, then without more the applicant is entitled to grant of a patent. *In re Oetiker*, 977 F.2d 1443, 1445, 24 U.S.P.Q.2d 1443, 1444 (Fed. Cir. 1992); *In re Grabiak*, 769 F.2d 729, 733, 226 U.S.P.Q. 870, 873 (Fed. Cir. 1985).

A *prima facie* case of obviousness is established when the teachings of the prior art itself suggest the claimed subject matter to a person of ordinary skill in the art. *In re Bell*, 991 F.2d 781, 783, 26 U.S.P.Q.2d 1529, 1531 (Fed. Cir. 1993). To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second,

there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed invention and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure. MPEP § 2142. In making a rejection, the examiner is expected to make the factual determinations set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 17, 148 USPQ 459, 467 (1966), *viz.*, (1) the scope and content of the prior art; (2) the differences between the prior art and the claims at issue; and (3) the level of ordinary skill in the art. In addition to these factual determinations, the examiner must also provide "some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness." *In re Kahn*, 441 F.3d 977, 988, 78 USPQ2d 1329, 1336 (Fed. Cir 2006) (cited with approval in *KSR Int'l v. Teleflex Inc.*, 127 S. Ct. 1727, 1741, 82 USPQ2d 1385, 1396 (2007)).

The Applicants respectfully submit that the combination of cited references fails to teach or suggest all the claim limitations of independent Claim 1. Specifically, Claim 1 recites, "an output of the LFSR comprising W output symbols, W being at least two, and the output symbols being generated during one clock cycle, a state transition of the LFSR being accomplished during one clock cycle via multiplication of the state vector by a state transition matrix to the power of W (multiple state transition matrix)."

The Office Action appears to suggest that Gu discloses multiplying a state vector by a state transition matrix to the power of W. However, Equation 1 of Gu referred to in the Office Action is as follows: $S_n = T^n S_0$. (See Gu, Col. 3, line 13.) As shown in Equation 1, the state matrix S_n is offset from initial state matrix S_0 by n states of the PN sequence. The transition matrix T^n is an initial transition matrix raised to the power n. (See Gu, Col. 3, lines 15-17.) Accordingly, the transition matrix of Gu is raised to the power of n, which is the number of states of the PN sequence. The transition matrix of Gu is not raised to the number of output signals generated during one clock cycle as set forth in Claim 1.

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Furthermore, Claim 1 also specifically recites, "wherein the elements of the second matrix are defined by:

$$
G_{i,j} = \begin{cases} 1 & , \text{if } i - j = W \\ g_{i+j-N+1} & , \text{if } (i + j \geq N - 1) \wedge (j \geq N - W) \\ 0 & , \text{otherwise} \end{cases}
$$

and the elements of the first matrix are defined by:

$$
P_{i,j} = \begin{cases} 1 & , \text{if } i = j \wedge i < N - W \\ p_{i+j-2N+W+1} & , \text{if } i + j \geq 2N - W - 1 \\ 0 & , \text{otherwise} \end{cases}
$$

wherein $p_0 = 1$, $p_i = \sum_{j=0}^{i-1} g_{N-i+j} p_j$ for $0 < i < N$, and g_0, g_1 up to and including g_{N-1} represent the configuration symbols which are comprised in the state transition matrix."

The Office Action appears to suggest that Col. 2, line 45 to Col. 3, line 65 of Hamatsu discloses this element of Claim 1. However, the Applicants were only able to find the following definitions in the cited section of Hamatsu:

At this time the equation of state of the shift registers can be written with respect to the dispersion time k, as follows;

<On the sender side> for $\forall k$

$$X(k+1)=AX(k), X(k)\neq 0 \tag{1}$$

<On the receiver side> for $\forall k$

$$Y(k+1)=BX(k), Y(k)\neq 0 \tag{2}$$

where X(k) and Y(k) are given by the following equations;

$$X(k) = \begin{bmatrix} x_1(k) \\ \cdot \\ \cdot \\ \cdot \\ x_\eta(k) \end{bmatrix}, \quad Y(k) = \begin{bmatrix} y_1(k) \\ \cdot \\ \cdot \\ y_\eta(k) \end{bmatrix}$$

and A and B are
in the case of the modular type

$$A = \begin{bmatrix} h_{\eta-1} & & \\ \cdot & & I_{\eta-1} \\ \cdot & & \\ h_1 & & \\ 1 & 0\ldots0 \end{bmatrix}.$$

$$B = \begin{bmatrix} 0\ldots0 & 1 \\ & h_1 \\ & \cdot \\ I_{\eta-1} & \cdot \\ & \cdot \\ & I_{\eta-1} \end{bmatrix}.$$

in the case of the simple construction type

$$A = \begin{bmatrix} 0 \\ \cdot \\ \cdot & I_{\eta-1} \\ \cdot \\ 0 \\ 1 & h_{\eta-1}\ldots h_1 \end{bmatrix},$$

$$B = \begin{bmatrix} h_1\ldots h_{\eta-1} & 1 \\ & 0 \\ & \cdot \\ I_{\eta-1} & \cdot \\ & \cdot \\ & 0 \end{bmatrix}.$$

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As shown, the definitions in Hamatsu are not the same as the definitions expressly recited in Claim 1.

Therefore, for all of the reasons established above, the Applicants respectfully submit that independent Claim 1 is patentable over the cited references.

Additionally, Claims 2 and 4-8 depend from Claim 1 and include all the limitations of Claim 1. As such, Claims 2 and 4-8 also are patentable over the cited references.

Accordingly, the Applicants respectfully request the Examiner to withdraw the § 103 rejections with respect to Claims 1, 2 and 4-8.

II.   CONCLUSION

As a result of the foregoing, the Applicants assert that the remaining Claims in the Application are in condition for allowance, and respectfully requests an early allowance of such Claims.

If any issues arise, or if the Examiner has any suggestions for expediting allowance of this Application, the Applicants respectfully invite the Examiner to contact the undersigned at the telephone number indicated below or at *rmccutcheon@munckcarter.com*.

The Commissioner is hereby authorized to charge any additional fees connected with this communication or credit any overpayment to Deposit Account No. 50-0208.

Respectfully submitted,

MUNCK CARTER, LLP

Date: ___8/19/2009___
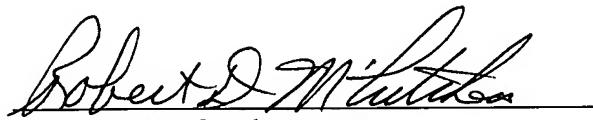
Robert D. McCutcheon
Registration No. 38,717

P.O. Box 802432
Dallas, Texas 75380
(972) 628-3632 (direct dial)
(972) 628-3600 (main number)
(972) 628-3616 (fax)
E-mail: *rmccutcheon@munckcarter.com*